

Youth and their Virtual Networked Words: Research Findings and Implications for School Libraries

Dr Ross J Todd

*School of Communication, Information and Library Studies at Rutgers, State University of New Jersey
Director of the Center for International Scholarship in School Libraries (CISSL)*

Rapid changes in the information and technology landscape provide challenges that at times conflict with traditional notions of school libraries and their role in learning, literacy and living. They herald important opportunities for school librarians to rethink, re-imagine and recreate a dynamic learning environment for school libraries. This shifting information environment includes the publishing arena increasingly characterized by a movement away from a “hard copy paradigm” (Rowlands & Nicholas, 2008, p. 8), the growth of a pervasive, integrated information environment characterized by vast quantities of digital content, open choice, collaborative and participatory digital spaces, and the transition of the Web environments from consumption of information to creation of information. This paper reviews recent literature focusing on young people’s use of the Web environment, particularly their use of Web 2.0. It identifies emerging Internet use patterns, and presents a set of challenges for school library leaders as they engage developments and continue in their acknowledged leadership role in building information technology environments in schools.

Background

The role of and value of information technology in school libraries has been extensively documented, and it is not the purpose of this paper to review that body of literature. [School Libraries Work!](#) (Scholastic Library Publishing, 2008) for example, provides an overview of studies undertaken across the USA and Canada that document the impact of school libraries may have on student learning. Many of these studies affirm the extensive use of information technology in school libraries as an enabler of learning, and the leadership role that school libraries have played in building the information technology environment for access to information and learning in schools. Findings of these studies show a correlation between student achievement and school library programs led by certified school librarians who, across a range of dimensions, “assist teachers and students to search out their information needs, critically evaluate the materials they locate, and use technological means to synthesize their findings into new knowledge” (Scholastic Library Publishing, 2008, p.9). Research studies in Ohio (Todd & Kuhlthau, 2005), Delaware ([Todd, 2005](#)), and Australia (Hay, 2006) demonstrate that students and classroom teachers clearly perceive the vital importance of information technology in the school library.

Copyright of works published in *School Libraries Worldwide* is jointly held by the author(s) and by the International Association of School Librarianship. The author(s) retain copyright of their works, but give permission to the International Association of School Librarianship to reprint their works in collections or other such documents published by or on behalf of the International Association of School Librarianship. Author(s) who give permission for their works to be reprinted elsewhere should inform the Editor of *School Libraries Worldwide* and should ensure that the following appears with the article. Reprinted, with permission, from *School Libraries Worldwide* Volume 14, Number 2, July 2008, pages 19-34.

Overall, access and use of information technology to help students with their school work ranked highly in the range of help provided by the school library with their schooling, as documented in Todd & Kuhlthau, (2005). In their qualitative responses, students saw a clear relationship between being able to access information through information technology and achievement in research assignments and projects. They particularly valued the instructional interventions of school librarians that not only fostered their development as effective users of information technology to search for and evaluate information, but also provided instruction in using information technology tools to construct representations of their knowledge. In the context of a networked information technology infrastructure, students highly valued the school librarian as teacher, particularly when he or she offered individual and class instruction centering on independent information seeking, Internet searching and site evaluation, judging information quality, and using a range of technical tools to develop and present their own ideas. Hay concludes that “the findings demonstrate an increasing dependence on, and demand for, a school library facility that provides students with access to ‘state of the art’ technologies, resources and services to support their learning”(Hay, 2006, p.27)

While these studies identify the considerable range of assistance that school libraries provide students through information technology infrastructures and instruction, recent studies identify a fundamental shift in the use patterns, not just with young people, but the community at large. Popular conceptions of young people as “gurus”, “savvy searchers”, “digital natives”, and of adults as the “digital immigrants” lagging behind in the technological revolution are inconsistent with current research. Data on media and Internet consumption suggest that older users are catching up, and the presumed generational differences are being eroded, particularly in terms of using Web 2.0 technologies for a wide variety of purposes. The “Google Generation” and “Silver Surfers” are becoming one (Rowlands & Nicholas, 2008, pp. 18, 21) and gaps are closing. These studies further suggest that writing on this topic has overestimated the impact of information technology on young people and underestimated its effect on the older generation. It is important to understand these use patterns so that appropriate service, instruction and professional development opportunities can be provided in the short term, and long term visioning, mission development and strategic planning can be put in place.

Adults Online: a Brief Overview

Madden’s telephone interview study (2006) of Internet use by American adults aged 18 and older shows that Internet penetration has reached an all-time high of 73%, up from 66% in 2005, with broadband connections reaching 42% and up from 29% in 2005. These adults also report considerable improvement since 2001 in their ability to shop, to pursue hobbies and interests, to do their jobs and in the way they get information about health care. Based on data collected through telephone interviews with 4001 adults aged 18 and over, Horrigan (2007) developed a three-tiered typology of American information and communication technology users. His work focused on *assets*: people’s use of Internet, cell phones and other devices that connect to the Internet; *actions*: online activities and their frequency that people engage in; *attitudes*: how people see the role of information technology helping them to be more productive in work, pursue leisure pursuits, and keep up with family and friends. The study identified 10 distinct groups of users of information and communication technology, and showed the

emergence of a diverse variety of Internet users and non-users--from those who engage heavily and actively in these emerging Internet platforms such as Web 2.0, to those who have little connectivity and are content with traditional media. This typology is shown in Table 1:

Table 1

Typology Of American Information And Communication Technology Users

	Group name	% of adult population	What you need to know about them
Elite Tech Users (31% of American adults)	Omnivores	8%	They have the most information gadgets and services, which they use voraciously to participate in cyberspace and express themselves online and do a range of Web 2.0 activities such as blogging or managing their own Web pages.
	Connectors	7%	Between featured-packed cell phones and frequent online use, they connect to people and manage digital content using ICTs—all with high levels of satisfaction about how ICTs let them work with community groups and pursue hobbies.
	Lackluster Veterans	8%	They are frequent users of the Internet and less avid about cell phones. They are not thrilled with ICT-enabled connectivity.
	Productivity Enhancers	8%	They have strongly positive views about how technology lets them keep up with others, do their jobs, and learn new things.
Middle-of-the-road Tech Users (20%)	Mobile Centrics	10%	They fully embrace the functionality of their cell phones. They use the Internet, but not often, and like how ICTs connect them to others.
	Connected but Hassled	10%	They have invested in a lot of technology, but they find the connectivity intrusive and information something of a burden
	Inexperienced Experimenters	8%	They occasionally take advantage of interactivity, but if they had more experience, they might do more with ICTs.
Few Tech Assets (49%)	Light but Satisfied	15%	They have some technology, but it does not play a central role in their daily lives. They are satisfied with what ICTs do for them.
	Indifferents	11%	Despite having either cell phones or online access, these users use ICTs only intermittently and find connectivity annoying.
	Off the Network	15%	Those with neither cell phones nor Internet connectivity tend to be older adults who are content with old media.

(Horrigan, 2007, p. ii)

The study found that a person’s gender, race, income or educational level did not specifically determine the group to which he or she belonged (Horrigan, 2007, p. 35), and that the broad claim that adults are novices or laggards is increasingly inappropriate. According to Jenkins, as reported by Baer on the Digital natives [blog](#) at Harvard University (2007), labels such as “digital immigrants” and “digital natives” increasingly oversimplify and over-exaggerate generational differences, and indeed, convey the assumption that young people have innate digital skills. Horrigan’s study also examined the range and number of activities regarding user-generated content, and these are summarized in the following Table 2 (2007, p. 3). What is particularly evident in these data is the active engagement with the Web, including content creation, beyond just the passive role of information consumption. The findings also support those of Rainie’s study of adult use of video sharing websites (2008, p. 1), which showed that 48% of online adults visit YouTube and other Internet video sites, compared to 33% in 2006.

Table 2
Actions of Internet Users

Actions: user-generated content	
Percent of Internet users who have done the following	
Share something online that you created yourself, such as your own artwork, photos, stories, or videos	19%
Post comments to an online news group or website	18%
Create or work on your own webpage	12%
Create or work on webpages or blogs for others, including friends, groups you belong to, or for work	11%
Take material you find online—like songs, text, or images—and remix it into your own artistic creation	9%
Create or work on your own online journal or weblog	8%
Source: Pew Internet & American Life Project April 2006 Survey. N=2,882 for Internet users. Margin of error is ±2%.	

(Horrigan, 2007, p. 3)

Teens Online: So What’s Changed?

All this serves to highlight some similar and challenging characterizations of children and adolescents aged 18 and below. This section first overviews a number of recent studies that characterize Internet use more broadly, before offering a deeper focus on their use of Web 2.0 technologies. The National Center for Education Statistics study of computer and Internet use by children and adolescents provides a useful base-line measure. It found that widespread use begins at an early age--about 90% of children and adolescents aged 5-17 use computers, and about 59% use the Internet. While no gender differences in overall computer or Internet use rates were found (in contrast to the 1990s when boys were more likely to use computers and the Internet than were girls), the study found that use was divided along demographic and

socioeconomic lines, with higher use among Caucasians than among African-Americans, Hispanics, Asians and American Indians. The study shows the ongoing importance of access at school and its role in bridging the digital divide, particularly for disadvantaged children and adolescents, with more children and adolescents using computers at school (81%) than at home (65%). A majority of 5- to 17-year-olds use home computers to play games (59%), to connect to the Internet for finding information and communication (46%), and to complete school assignments (44%) (DeBell & Chapman, 2003, pp. iv, v, vi).

In the context of widespread use of the Internet, the Rowlands & Nicholas study (2008) sought to identify how young people in school or pre-school years, labeled as the “Google generation ... with little or no recollection of life before the web” (p. 5) and born after 1993, are likely to access and interact with digital resources in five to ten years’ time and what this means for the provision of library and information services. In particular, the study sought to establish if these young people, as a result of developments in the digital environments, are searching for and researching content in new ways and whether this is likely to shape their future behaviors as mature researchers; whether or not new ways of researching content will prove to be any different from the ways that existing researchers and scholars carry out their work; and to provide an arena for discussion about the future of libraries in the Internet era. The findings were derived from a comparative analysis of literature from the 1980s (Generation X) and 1990s (Generation Y), and from data drawn through deep log analysis techniques of web-based information resources used by college students to chart different information searching and use patterns, and so represent an important, up-to-date synthesis. The study revealed four major developments:

- college students are using libraries less since they first began using Internet research tools;
- search engines are the primary starting point for information searching, with low levels of starting search from a library website;
- searchers tend to be more satisfied with their overall experience of using a search engine compared to a librarian-assisted search; and
- books are still the primary library brand association despite huge investment in digital resources, of which they are largely unfamiliar (Rowlands & Nicholas, 2008, p.7)

In addition, the study identified some predominant virtual information-seeking behaviors of students:

- (1) horizontal information seeking characterized by skim viewing a small number of pages then a “bounce” out, often never to return;
- (2) spending as much time navigating virtual libraries as actually viewing what they find;
- (3) spending very little time on e-book and e-journal sites, and engaging in a “power browse” kind of reading of scanning rapidly, targeted to quick decisions, and rapid authority assessment/retrieval;
- (4) clicking extensively and making little use of advanced search capabilities; and
- (5) squirreling behavior of stockpiling content in the form of downloads (Rowlands & Nicholas, 2008, p. 10).

Rowlands and Nicholas also examined available research in information searching and use behaviours before the onset of the Internet. They concluded that despite increased access to information technology and information sources electronically, behaviours that predate the

Web continue to persist. These behaviours show little improvement in information literacy capabilities such as evaluating the relevance, accuracy and authority of information, and developing effective search strategies. Students continue to show a preference for natural rather than controlled language; tend to use simple search strategies that miss relevant documents; undertake repeated searches; and have an unsophisticated mental map of the Internet as a networked entity of multiple providers (Rowlands & Nicholas, 2008, p. 15). They conclude that there is very little evidence that the Google generation is fundamentally different from those who came before nor that the search skills of young people have improved with time, or that indeed they are developing as expert searchers. Instead, they claim that pre-Internet research also shows that young people did not review information retrieved from online databases for relevance and undertook unnecessary supplementary searches when they had already obtained the information required (Rowlands & Nicholas, 2008, p. 15). While an immediate reaction from school librarians is likely to be “I’m not surprised” it does bring to question the nature of the instruction, or lack of it, in school libraries, that needs considerable review and refinement. It is also critical that librarians re-imagine and reshape not just instructional practices, but also rethink access practices.

The Web 2.0 Environment

The above general picture takes on an even richer layer of complexity in the context of teens’ engagement in the Web 2.0 environment. Web 2.0 is typically defined as the second generation of web-based environments which seek to facilitate communication, community, collaboration and creativity between users (O’Reilly, 2005a). As a heterogeneous mix of existing and emerging technologies that move beyond static webpages, its functional space comprises social network sites, blogs and online diaries, wikis, podcasts, videoblogs, content creation mechanisms, syndicated content feeds, folksonomies and tagging and microcontent. It is a networked digital environment built on technical structures for facilitating participation, and interaction and user-generated content. It is heralded as the “commons of cyberspace” and “the next phase of the information society” (Horrigan, 2007, p. i). Web 2.0 is an “architecture of participation” based on social software where users generate content, thus distinguishing it from the Web as we have known it for 15 years, where users fundamentally consume content (O’Reilly, 2005a, p.1).

Alexander (2006, p. 33) argues that with the focus on extensive engagement with microcontent, social and intellectual practices are being shaped in new ways. This is evolving through such innovations as “posts” and “discussion threads”, streams of conversation, revision of content, movement of content blocks (for example, podcasts shuffled between websites) and participants constantly building microcontent into new content forms, and often in an open environment. He claims that such interactive and participatory approaches to content “informs a way of making, sharing and consuming digital documents—a way that differs from what we have grown accustomed to” (p. 34). In essence, Web 2.0 is a platform that moves beyond the selection of ideas, to facilitating the creation and production of them. While the Web to date has been fundamentally about connectivity and access to vast repositories of information, and consumption of fixed content, Web 2.0 appears to have shifted the focus of Web applications from information to people’s active interactions with information, networking

and the construction of and sharing of ideas. It is a shift from an information environment—one of finding locating and evaluating information—to one of using information, creating knowledge and sharing of ideas.

The Social Networking Phenomena

At the centre of Web 2.0 is the burgeoning development of social network sites. Boyd and Ellison (2007) define social network sites as “web-based services that allow individuals to construct a public or semi-public profile within a bounded system, to articulate a list of other users with whom they share a connection, and view and traverse their list of connections and those made by others within the system” (Boyd & Ellison, 2007, p.1) . According to Boyd and Ellison, such sites are unique in that they enable users to articulate and make visible their social networks to facilitate communicating with people, typically labeled as "Friends," "Contacts," and "Fans" who are already a part of their extended social network. Such sites—for example, MySpace, Facebook, Cyworld, SixDegrees, and Bebo—offer a variable range of features for information sharing, such as photo-sharing, video-sharing, blogging and instant messaging capabilities, and increasingly, capabilities for mobile interactions. At the same time, there is the emergence of specific sites for geographic (e.g., [Hyves](#) for Dutch teens), ethnic (e.g., [BlackPlanet](#) for African Americans), religious (e.g., [MyChurch](#) for Christian churches), sexual orientation and many other identity-driven categories in mind (e.g., [Gaia](#) for comic book, anime and games fans; [LinkedIn](#) and [Ryze](#) as professional business networks; [dogster](#) and [catster](#) for animal lovers; [LibraryThing](#) for book lovers, and [Ning](#), one of a growing number of sites with capacity to create your own social network site.

[ComScore](#), a commercial online company that focuses on measuring the ways in which the Internet is used and the wide variety of activities occurring online, documents the rapid worldwide growth of social network sites. Based on June 2006 and June 2007 benchmarks, it reports that Facebook has grown considerably by 270%, from 14,083,000 unique visitors to 52,167,000 unique visitors. ComScore charts Bebo as having grown about 172%, and Orkut as having grown about 78% . During the same time period, MySpace grew from about 66.5 million unique visitors to over 114 million. MySpace and Facebook both have large percentages of their users in North America (62.1% for MySpace, 68.4% for Facebook) with sizeable portions in Europe (24.7% for MySpace, 16.8% for Facebook) and single-digit numbers in all other regions. Bebo, most popular in the U.K., is largely the opposite, with 62.5% of its users based in Europe, 21.8% in North America, and few elsewhere. (Statistics available at: http://www.news.com/8301-13577_3-9752857-36.html). Tagged, one of the most recent social networking sites, which describes itself as providing “a fun, safe, and exciting environment for teens to showcase their personalities and talents, while offering advertisers a laser-focused vehicle aimed at the unique teen marketplace, (http://corp.tagged.com/market_intention_release.html) showed the greatest overall growth—a 774% increase from 1,506,000 unique visitors in June 2006 to 13,167,000 unique visitors in June 2007. Against this backdrop, prevailing opinion and recent research suggest that web-based social networks—their structures and dynamics—appear to be an important driver of young people’s information use. These are significant developments; their growth and implications for school libraries cannot be considered lightly.

Social Network Theory

While the concept of social networks has come to be associated with the Web, the broader theoretical area of social networks has a rich and extensive history. Social network theory and approaches to social network analysis have been used in many social science arenas for over 50 years--including library and information science, social psychology and adolescent studies--to examine complex patterns of interrelationships and interactions, focusing on how the structure, nature and strength of ties affect individuals and their relationships.

According to Ethier (2004) and Kadushin (2000) the term “network” refers to a set of objects, or nodes, and a mapping or description of the relationships between the objects. In the case of social networks, the objects refer to people or to groups of people. Social network analysis is based on three key assumptions:

the importance of relationships among interacting units; participants (commonly referred to as actors) and their actions are viewed as interdependent rather than independent, autonomous units;

relational ties (linkages) between participants are channels for transfer or flow of resources (either material or nonmaterial); and

the network structural environment provide opportunities for or constraints on individual action (Wasserman & Faust, 1994).

Social network analysis also assumes that understanding these relationships connecting one individual to others sheds light on not just the patterns of people's interaction, but also on communication patterns, group dynamics and pressures inherent in the structures, social roles such as power and leadership structures, affective dimensions such as likes and dislikes, cognitive aspects such as viewpoints and levels of knowledge; as well as behaviours and actions, including information seeking and use behaviours, and the sharing and transfer of material resources. In recent years, scholars engaged in social network analysis have given attention to how social network theories can describe the formation of public opinions, the development of group consensus, implicit and explicit group rules, group leadership and reputation, dynamics of mutual self interest, social support, collective action and involvement in political institutions (Ethier, 2004; Monge & Contractor, 1998).

Social network analysis proves a useful framework for beginning to understand the dynamics of young people's participation in Web 2.0. Social analysis provides a framework for characterizing the participants, the relationships they build, their interactions and the dominant trends in the use of these networks. This analysis synthesizes data from four recent studies undertaken of young people's use of social network sites. These studies are: Lenhart & Madden (2007) *Social Networking Websites and Teens: An Overview*; Lenhart, Madden, Macgill, & Smith. (2007), *Teens and Social Media*; Macgill (2007) *Parent and Teenager Internet Use* and Lenhart (2007) *Cyberbullying and Online Teens*. These four reports, published by Pew Internet as part of their American Life Project, were based on data derived from 2,006 telephone interviews with a randomly generated sample of youth 12-17 and a parent or guardian, and involved 935 parent-child pairs. Also included in this analysis are data from National School Boards Association (NSBA) 2007 study: *Creating and Connecting//Research and Guidelines on Online Social - and Educational – Networking*. This study comprised an online survey of 1,277 9- to 17-year-old

students, an online survey of 1,039 parents, and telephone interviews with 250 school district leaders who make decisions on Internet policy.

Information Behaviors of Teens in Social Network Sites

Collectively these studies provide a rich picture of teens' and adults' engagements with Web 2.0, illuminating some key differences between the two groups. Both the Pew Internet and NSBA data show an increasing number of teens using the Internet as a nucleus for social interaction, a place for communication and interaction, and for creating and sharing original works. In a short period of years, the use of Web 2.0 in particular appears to have become central to the lives of teens, and online activities are deeply embedded in their lifestyles, even rivaling television in terms of time commitment.

Particularly noteworthy are the following patterns that emerge from both studies. There are extremely high levels of online use by teens, with over 90% of teens with online access using social networking technologies, such as chatting, text messaging, blogging and visiting social network sites, with many visiting such sites on a daily basis. The majority of online teens have created a personal profile online, and use social networking sites, predominantly MySpace, and to a much lesser extent Facebook, Xanga, Piczo, Gaiaonline and Tagged (Lenhart & Madden, 2007, p. 2). Up to two-thirds of teens who have created a profile say that their profile is not visible by all Internet users and limit access to their profiles (Lenhart & Madden, 2007, p. 5). The Pew Internet study also found that adults restrict access to the same content less often.

Teens visit social network sites frequently—not just daily, but several times daily. While older girls are the most avid users of social networking sites, with more girls than boys using social network sites and creating online profiles, this is not the domain solely of older teens. Almost half of 12- and 13-year-olds report posting a profile to an online social network (Lenhart & Madden, 2007, p.2).

Teen involvement in these sites is not passive engagement. The Pew and NSBA studies show increasing content creation. They go beyond basic communications and content movement such as downloading and uploading music and videos; updating personal sites and online profiles, and posting photos, to engaging in highly creative activities such as blogging, posting messages, creating and sharing virtual objects, remixing content found online into their own creation, creating new characters, participating in collaborative projects, sending suggestions or ideas to websites, submitting artistic and creative works such as artwork, photos, stories, videos and microcontent to sites, and creating polls, quizzes or surveys (NSBA, 2007, p. 3).

The studies show that participants have constructed complex networks of friends who form close-knit groups, and engage with these groups actively in a variety of ways. These include: posting messages to friends' profiles, pages or "walls."; sending private messages to friends within the social network system; active dialog with people who comment on their digital photos and creative postings; creating or working on webpages or blogs for others; creating online journals or blogs (NSBA, 2007, p. 2; Lenhart & Madden, p. 6). Content creation is not just about sharing creative output; it is also about participating in conversations fueled by that content. The posting of such content, including high activity in sharing digital images,

appears to play an important role in initiating virtual conversation through feedback, and establishing new relationships and entry into allied networks and groups.

Overall, girls dominate most elements of content creation, with older girls more likely to blog than older boys, with a rapidly increasing number of younger teens--both boys and girls--getting into blogging. Older online boys, however, are more actively engaged than girls in watching videos and sharing videos on video sharing sites such as YouTube. (Lenhart & Madden, p. 5-6; Lenhart et al., 2007, p. ii). The NSBA study specifically shows that they talk about education related topics, including their current school work, college choice, careers, and jobs, and engage actively in discussions and debates about politics, religion, and morals (NSBA, 2007, p.1)

The Pew / Internet and NSBA studies identify two significant groups. The first is the “supercommunicators,” predominantly older girls employing multiple technical devices for maintaining social network communication, including traditional landline phones, cell phones, texting, instant messaging, and email, which appears to be the least popular form of daily social contact (Lenhart et al., 2007, p. iv). The second group, identified in the NSBA study, is the “nonconformists,” a sizeable proportion (31%) of teens who are the adventurous pacesetters for their peers (NSBA, 2007, p. 4). These teens are the most frequent users of social network sites, break online safety and behavior rules such as using inappropriate language, posting inappropriate pictures, sharing personal information with strangers or pretending to be someone else. They are also the teens who are on the cutting edge of social networking, taking a lead in creating, producing and manipulating online content, keeping up with latest developments and software, recommending and disseminating content, learning about and disseminating information on new sites and features, organizing group events, marketing and recruiting others to their sites. Ironically, the study found that these teens are also more likely to be in touch with their parents as well, communicating with them in every way except in person. While this group seems to have developed communication, creativity, collaboration, and technical skills, they are significantly more likely than other students to have lower grades.

The studies show that teens are device-oriented, and while there are now similar technology profiles for adults and teens, most teens who are online say that the Internet and devices such as cellphones, iPods, MP3 players and digital cameras make their lives easier (Macgill, 2007, p. 1). Teens say social network sites help them manage their friendships, make plans with friends, maintain contact with friends they see frequently, and those they rarely see in person, and make new friends--the latter especially important for older boys, who also like to use social network sites to flirt (Lenhart et al., 2007, p. 6).

While most of their parents continue to believe that the Internet plays a beneficial role in teen life, this perception is decreasing. Parents involved in these studies do have concerns. These primarily revolve around content rather than time spent on technology devices. A majority of parents have rules governing Internet use. These rules focus on which Internet sites can be visited; access to videos and video games; and how much time a child can spend online. Parents are clearly aware of teens’ online behaviours, and actively check website access (Macgill, 2007, p. 2).

Data show that a very small percentage of teens and parents have expressed concerns about unwelcome strangers, pressure by strangers to meet with teens, teens receiving

inappropriate content, pictures, and language, and being drawn into uncomfortable conversations. However, they also acknowledge that these are similar to problems encountered in everyday life and through television and popular music. Online harassment is emerging as an increasing dynamic of social network sites. Almost a third of teens surveyed in the Pew / Internet study claimed they have experienced online harassment, with girls more likely to be victims than boys (Lenhart, 2007, p. 1). Teens who share their identities and thoughts online are more likely to become targets than are those who lead less active online lives. Predominant forms of online harassment include forwarding or posting private email, IM, or text elsewhere; spreading a rumor about a person online; sending a threatening or aggressive email, IM, or text message; and posting an embarrassing picture without permission (Lenhart, 2007, p.2). The key reasons for bullying include: the ease and simplicity of being able to replicate and quickly transmit digital content; the ability to be insulated from the consequences of actions and hiding behind a computer monitor; and intolerance for a range of social, cultural and personal differences (Lenhart, 2007, p. 5). However, most teens said that they are more likely to be bullied offline than online (Lenhart, 2007, p. 4). The NSBA data showed that reported levels of cyberstalking, cyberbullying and unwelcome personal encounters are lower than what school leaders fear and what policies seem to imply. School district leaders interviewed defended their position by claiming that negative experiences with social networking are more common than students and parents report (NSBA, 2007, p. 5-6).

Some school leaders and especially parents have strong expectations about the positive roles that social networking could play in students' lives. Many do not have sustained and diverse experience with social network sites. School officials are not yet convinced of their value as a useful educational tool or communications tool, and more so than parents, remain highly skeptical at this point. Both parents and school leaders demand an educational value and purpose as a condition for using social networking technologies in schools. They see the potential to help students "get outside the box" in some way or another; introduce students to "new and different kinds of students"; "learn to express themselves better creatively and improve social skills"; "develop global relationships"; "help students improve their reading or writing or express themselves more clearly"; "learn to work together to solve academic problems"; and "improve children's ability to resolve conflicts". Parents clearly expect schools to protect students during the school day, including online safety. School leaders and parents insist on adult monitoring and would continue to prohibit chat and instant messaging as conditions of social networking use in school (NSBA, 2007, p. 7).

Challenges for School Libraries

Such patterns in teens' information seeking and use in Web environments, especially Web 2.0, challenge us as library and information science professionals, educators and scholars to imagine a different information landscape and learning environment for young people. Whether we like it or not, or agree with it or not, they are leaving behind the traditional world of print. Their patterns of information seeking and use challenge us first to listen to the research evidence and then to understand what is going on. They challenge us to imagine how we might use information technology much more effectively and much more creatively to open up to them the world of ideas and enable them to find their own intellectual pathway and to develop

creative outputs through it. They challenge us to imagine how we might meaningfully enable the development of intellectual quality in this rich and perhaps confronting e-environment, and one where evidence suggests that information behaviors are at times shallow and superficial, yet seemingly satisfying to them. They challenge us to imagine how we might more effectively structure the information environment and the information-to-knowledge experience through school libraries to provide a rich interactive learning community for them, and to ensure that the deep knowledge and deep understanding, not just of curriculum goals, but of their complex information worlds that they are drawn into, are achieved.

At the heart of recent developments in the Web, the emergence of Web 2.0, and the social networking phenomena is the fundamental question: what of school libraries of the (near) future? Historically, the core values of the professional school library community have centered on flexibility, collaboration, and the development of responsive information services, quality teaching and learning environments. Web 2.0 puts these to the test. Such findings should encourage us to think outside of the box in terms of what school libraries are and what is their fundamental purpose. The broader educational focus on learning outcomes that centers on the construction of deep knowledge and deep understanding in the first instance challenges us to move beyond the traditional school library concentration on mastery of sets of information skills. It is clear that teens on the Web are pushing communication and creative boundaries. In particular, the social networking phenomena is showing us that the Web is no longer just a tool and base for information access and finding—the information consumption paradigm that has underpinned the development of libraries. While teens continue to consume content provided on the Worldwide Web to meet their curriculum requirements and personal needs, they are also becoming active in creating their own content and using social networking technology to share it. This challenges us to rethink the school library as a knowledge commons that both intersects with and bridges the digital and print terrain, and provides the intellectual tools across these multiple environments to foster creativity, to enable young people to develop their own personal knowledge and understanding of the curriculum, the world and themselves, to interpret and apply knowledge they interact with, and to foster the intellectual, social and cultural growth of our young people in a 24/7 time-space environment.

Conceptualizing school libraries as knowledge commons and not information places shifts the instructional program from accessing and locating and evaluating information, to providing students with the essential knowledge-developing competencies: critical thinking and communication competencies, knowledge creation processes, developing arguments and positions and viewpoints; dealing with conflicting ideas and evidence (including dealing with unwanted, offensive information inputs), constructing creative and meaningful representations of new knowledge, and communicating ideas in thoughtful ways.

It is clear that social network sites and tools play an important role for teens in this regard; the challenge is to harness it in educationally meaningful and compelling ways that break loose from static ways of learning that often confine and stifle creativity. The data collectively provide a simple yet complex challenge for all educators: explore social networking sites, learn and try out the kinds of creative communications and collaboration tools that students are using, so that your perceptions and decisions about these tools are based on real experiences. Indeed, an instructional program centering on inquiry, knowledge construction

and communication will be the distinguishing feature of school libraries if they are to flourish in this environment.

School librarians have a golden opportunity to lead in this development. The challenge is to harness the momentum, not fight it. Opportunities include using social networking tools for faculty communications and professional development; experimenting with blogs, wikis, even chat rooms and messaging to build a 24/7 school library; set up wikis for collaborative group projects with faculty and students, establish literature blogs and show the learning that can take place. The school library has enormous potential to develop the creative social and knowledge based skills for effectively participating in these social network arenas. These are the skills that students need to be active and thoughtful participants in Web 2.0, and to benefit and learn from being there. And the nonconformists? Here is a golden opportunity to bring in the nonconformists who are highly engaged and skilled at social networking (as identified in the NSBA study, p. 4) to showcase their skills, to teach and to lead. Here is a wonderful opportunity for school librarians to help them improve their academic results, and at the same time, learn about the cutting-edge developments on the Web that are going to capture the attention of students.

The momentum of Web 2.0 provides a challenging opportunity for schools and school libraries to re-examine their Internet/Web use policies, and in particular, policies related specifically to use of social networks. Safety policies remain vitally important to all educators and parents. At the same time, contextualized learning is a basis for meaningful learning. Teaching students about online safety and responsible online communication and knowledge creation, and developing social literacies makes more sense in meaningful learning experiences where students use social network tools. Guided inquiry is a key framework for intervening in and staging the information-to- knowledge experience, and engaging these tools and their masterful use in authentic research tasks, gathering data using blogs and other technical tools, sharing the creative development of knowledge representations, and communicating knowledge outcomes. School libraries, as creative knowledge commons, can lead in rich collaborative projects with other schools, student-run blogs and discussion forums. A key challenge is to lead and demonstrate the rich educational potential, and document evidence of significant learning outcomes, including virtual publishing and broadcasting of newly gained knowledge and skills.

The challenge for school libraries is to understand actual behavior of today's young people in their information landscape. They are voracious users of all forms of digital media, developing new forms of online reading patterns, engaging in new kinds of social structures, exploring creative expression in different ways, actively contributing to the content explosion on the Web--not necessarily in ways that school librarians assume or want or believe to be right--and through social tagging and using everyday language, are even challenging the very foundation of access into the information world. How to accommodate rather than resist this force must be the center of sustained discussions in schools. To not do this is to make school libraries even more marginal to the world of young people.

Against this challenging landscape, we might agree with Crawford and Gorman's view in their book *Future Libraries: Dreams, Madness, and Reality*: "Let us state, as strongly as we can, that libraries are not wholly or even primarily about information. They are about the

preservation, dissemination, and use of recorded knowledge in whatever form it may come . . . so that humankind may become more knowledgeable; through knowledge reach understanding; and, as an ultimate goal, achieve wisdom” (Crawford & Gorman, 1995). However, amidst this virtual world, how we maintain the human touch is also an important question. Students clearly do value personal engagement and involvement in their learning. They value the real-time presence of and interaction with school librarians, their personal responsiveness and immediacy of help in their learning journey. The personal stories told by students in studies in Ohio and Delaware (Todd & Kuhlthau, 2005; Todd, 2005) attest to this. The recent report *Museums and Libraries Engaging America’s Youth* has found that museums and libraries as physical places bring unique assets to youth development. They include not just collections of authentic objects, artefacts, and information resources, but also dedicated, knowledgeable staff; opportunities for personalized, hands-on learning, support for cognitive and social development, and experiences (Koke & Dierking 2007). These are about self, knowledge and networks. And these are about the essential human touch that school libraries provide.

Aldous Huxley’s thought-provoking novel *Brave New World* presents a confronting, challenging, frightening vision of life in a technologically advanced society. The brave new world of school libraries, in contrast, provides exciting opportunities for school librarians and classroom teachers to re-imagine the information-to-knowledge landscape for young people and chart meaningful approaches to instruction and information services. The rapid developments in information technology and the Web environments provide never-to-be-had opportunities to open the world of ideas to our students in collaborative and integrated ways, to personalize learning, and to immerse them in the journey of inquiry, discovery and creativity. Marc Prensky, educator and developer of game technology for learning, claims that young people are powering down in schools—not just their devices, but their brains. He claims: “It’s their after-school education, not their school education, that’s preparing our kids for their 21st century lives – and they know it. . . .When kids come to school, they leave behind the intellectual light of their everyday lives and walk into the darkness of the old -fashioned classroom” (Prensky, 2008, pp. 41, 42). In this brave new world of Web 2.0, the visionary, creative and learning centered leadership of school librarians can play a vital role in turning on the lights.

References

- Alexander, B. (2006). Web 2.0: A New Wave of Innovation for Teaching and Learning? *Educause* (March/April 2006), 33-44. Available at: <http://connect.educause.edu/Library/EDUCAUSE+Review/Web20ANewWaveofInnovation/40615?time=1203867725>
- Boyd, D.M., & Ellison, N.B. (2007). Social network sites: Definition, history, and scholarship. *Journal of Computer-Mediated Communication*, 13(1). Available at: <http://jcmc.indiana.edu/vol13/issue1/boyd.ellison.html>
- DeBell, M., & Chapman, C. (2003). *Computer and Internet Use by Children and Adolescents in 2001: Statistical Analysis Report*. Washington DC, National Center for Education Statistics, US Department of Education. Available at: <http://nces.ed.gov/pubs2004/2004014.pdf>
- Ethier, J. (2004). Current Research in Social Network Theory. Available at: <http://www.ccs.neu.edu/home/perrolle/archive/Ethier-SocialNetworks.html>

- Crawford, W., & Gorman, M. (1995). *Future Libraries: Dreams, Madness, and Reality*. Chicago: American Library Association.
- Hay, L. (2006). School libraries as flexible and dynamic learning laboratories . . . that's what Aussie kids want. *Scan*, 25(2), 18-27.
- Horrigan, J. (2007). *A Typology of Information and Communication Technology Users*. Pew Internet & American Life Project; Washington DC Available at: <http://www.pewinternet.org/pdfs/PIP ICT Typology.pdf>
- Jenkins, H., in J. Baer: "Digital natives" under attack! (as a metaphor) Digital natives blog at Harvard University (2007). Available at: <http://blogs.law.harvard.edu/digitalnatives/2007/12/19/digital-natives-under-attack-as-a-metaphor/>
- Kadushin, C. (2000). *A Short Introduction to Social Networks: A Non-Technical Elementary Primer*. New York, Cohen Centre for Modern Jewish Studies, Brandes University and Graduate Centre City University of New York.
- Koke, J., & Dierking, L. (2007). *Museums and Libraries Engaging America's Youth: Final Report of a Study of IMLS Youth Programs, 1998-2003*. Institute for Museums and Library Services. Available at: <http://www.imls.gov/pdf/YouthReport.pdf>
- Lenhart, A. (2007). *Cyberbullying and Online Teens*. Pew Internet & American Life Project; Washington DC. Available at: <http://www.pewinternet.org/pdfs/PIP%20Cyberbullying%20Memo.pdf>
- Lenhart, A., & Madden, M. (2007). *Social Networking Websites and Teens: An Overview*; Pew Internet & American Life Project; Washington DC. Available at: <http://www.pewinternet.org/pdfs/PIP SNS Data Memo Jan 2007.pdf>
- Lenhart, A., Madden, M., Macgill, A., & Smith, A. (2007). *Teens and Social Media*. Pew Internet & American Life Project; Washington DC. Available at: <http://www.pewinternet.org/pdfs/PIP Teens Social Media Final.pdf>
- Macgill, A. (2007). *Parent and Teenager Internet Use*. Pew Internet & American Life Project; Washington DC. Available at: <http://www.pewinternet.org/pdfs/PIP Teen Parents data memo Oct2007.pdf>
- Madden, M. (2006). *Internet Penetration and Impact*. Pew Internet & American Life Project; Washington DC. Available at <http://www.pewinternet.org/pdfs/PIP Internet Impact.pdf>
- Monge, P.R., & Contractor, N.S. (1998). Emergence of communication networks. In L. Putnam & F. Jablin (Eds.), *New handbook of organizational communication*. Newbury Park, CA: Sage. Available at: <http://hyperion.math.upatras.gr/commorg/nosh/HOCNets.html>
- National School Boards Association (NSBA) (2007). *Creating and Connecting//Research and Guidelines on Online Social—and Educational—Networking*. Available at: <http://files.nsba.org/creatingandconnecting.pdf>
- OCLC (2006). *College Students' Perceptions of the Libraries and Information Resources: A Report to the OCLC Membership*. Dublin, OH: OCLC, 2006.
- O'Reilly, T. (2005a). *What Is Web 2.0? Design Patterns and Business Models for the Next Generation of Software*. Available at: <http://www.oreillynet.com/lpt/a/6228>
- O'Reilly, T. (2005b). In Singel, Ryan: *Are you ready for Web 2.0?* Available at: <http://www.wired.com/science/discoveries/news/2005/10/69114>
- Prensky, M. (2008). Turning on the Lights. *Educational Leadership*, 65(6), March, 40-45. Available at: <http://www.marcprensky.com/writing/default.asp>
- Rainie, D.L.. (2008) *Video Sharing Websites*. Pew Internet & American Life Project; Washington DC. Available at: <http://www.pewinternet.org/pdfs/Pew Videosharing memo Jan08.pdf>
- Rowlands, I., & Nicholas, D. (2008). *Information behaviour of the researcher of the future. A CIBER Briefing Paper*. Commissioned by British Library & Joint Information Systems Committee. Centre for

- Information Behaviour & the Evaluation of Research (CIBER), University College London (UCL), 11 January. Retrieved February 2, 2008, from <http://www.bl.uk/news/pdf/googlegen.pdf>
- Scholastic Library Publishing (2008). *School Libraries Work!: Research Foundation Paper*. Updated 2008 Edition. Scholastic Library Publishing, New York, NY.
- Todd, R. (2005). *Report of the Delaware school library study*. New Brunswick, NJ.: Center for International Scholarship in School Libraries. Available at: <http://www2.lib.udel.edu/taskforce/study/phasetwo.pdf>
- Todd, R., & Kuhlthau, C. (2005). Student learning through Ohio school libraries, Part 1: How effective school libraries help students. *School Libraries Worldwide*, 11(1), 89-110.
- Wasserman, S., & Faust, K. (1994). *Social Network Analysis*. Cambridge: Cambridge University Press.

Author Note

Dr. Ross J. Todd is Associate Professor in the School of Communication, Information and Library Studies at Rutgers, the State University of New Jersey. He is Director of the Center for International Scholarship in School Libraries (CISSL). Current research focuses on three key themes: examining the impact of implementing an inquiry-based approach to learning centering on the Information Search Process developed by Professor Carol Kuhlthau on student learning outcomes; understanding more fully the cognitive dynamics of adolescent information seeking and use, with particular emphasis on changing information intents and patterns of knowledge construction; and developing an evidence-based practice framework for school librarians.